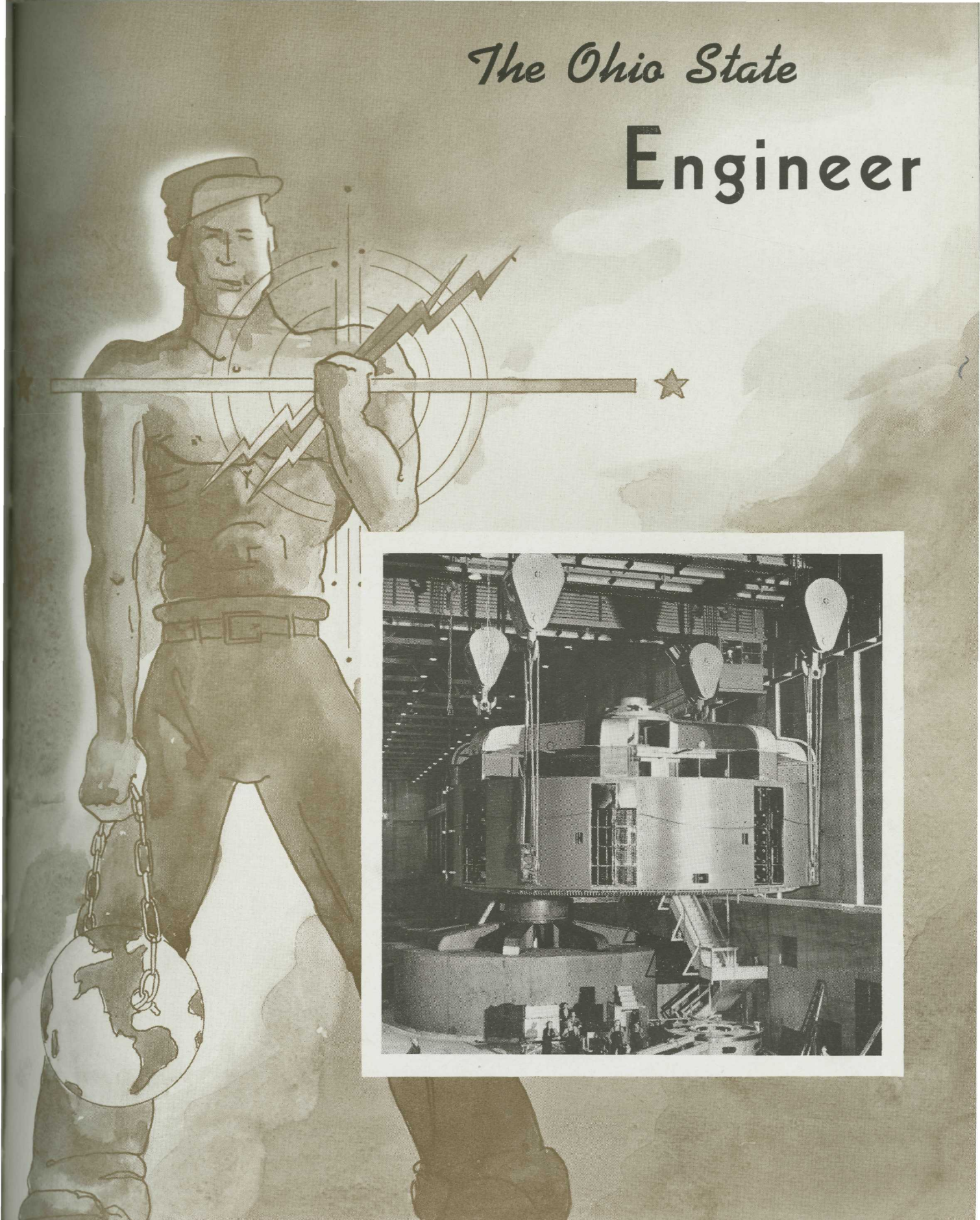
The Ohio State Engineer

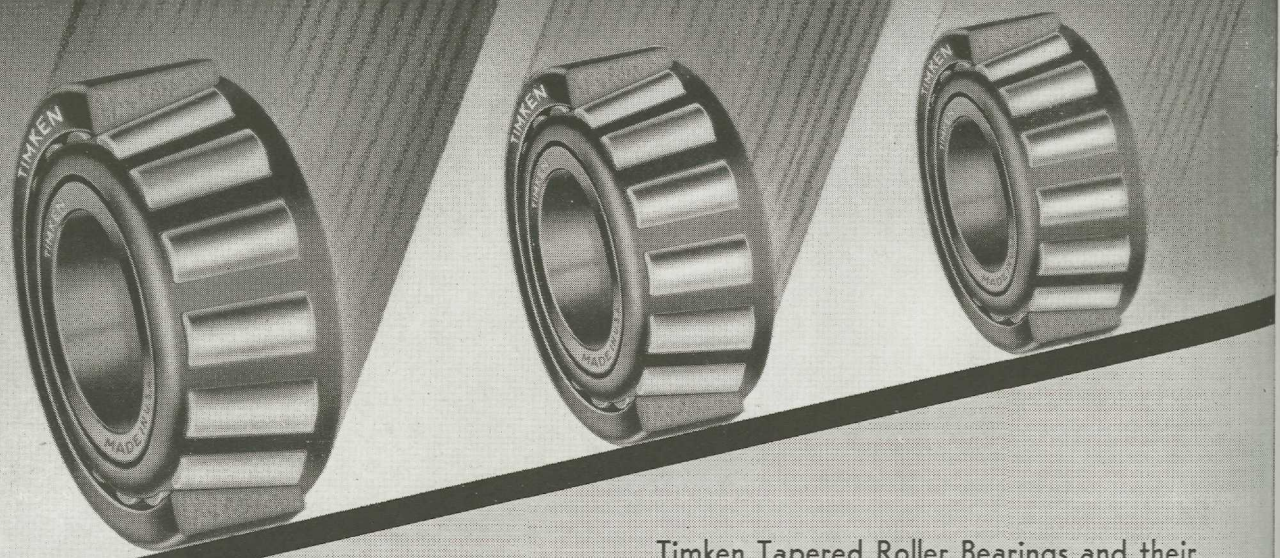


November 1942

Member of Engineering College Magazines Associated

Prepare for post-war reconstruction—

learn to "know your bearings" now



A heavy part of the burden of world reconstruction following the United Nations' victory in the war will have to be borne by graduate engineers, now in school.

Revolutionary advancements in machines of all kinds will be the order of the day and, among other things, you'll have to know your bearings in order to be able to hold your own when competition gets tough.

By getting a sound basic knowledge of Timken Tapered Roller Bearings and their application now, you will be that much ahead of the game when the time comes, for you will be prepared to solve any bearing problem that ever is likely to come up.

Furthermore, through the intelligent use of Timken Bearings you will be able to create machines that not only *perform better,* but also *sell better*—for wherever civilization exists, no name in bearings means so much to the machine buyer as "TIMKEN".

Our engineers—specialists in bearing design and application—will be glad to help you in your study of Timken Bearings.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

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TAPERED ROLLER BEARINGS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

HE SPECIALIZES IN "BIG STUFF."

L. A. Kilgore has been designing electric generators, rectifiers, and motors ever since he joined Westinghouse . . . but his 40,000 h.p. Wright Field wind-tunnel motor tops them all. Kilgore received his E. E. at the University of Nebraska and his M.S. at the University of Pittsburgh.

The hurricane that shapes an eagle's wings.

THE LIGHTNING SPEED of the modern warplane has brought a lot of headaches to aircraft designers.

Wind-tunnels, the "proving grounds" of aviation, were satisfactory for studying the performance of the lighter, slower planes of yesterday. But they were not adequate for today's fighter planes . . . with top speeds of *over 400 miles per hour.*

To investigate the terrific forces at work at these high speeds, the U. S. Army demanded a wind-tunnel that would produce a tornado many times greater than Nature's wildest gale.

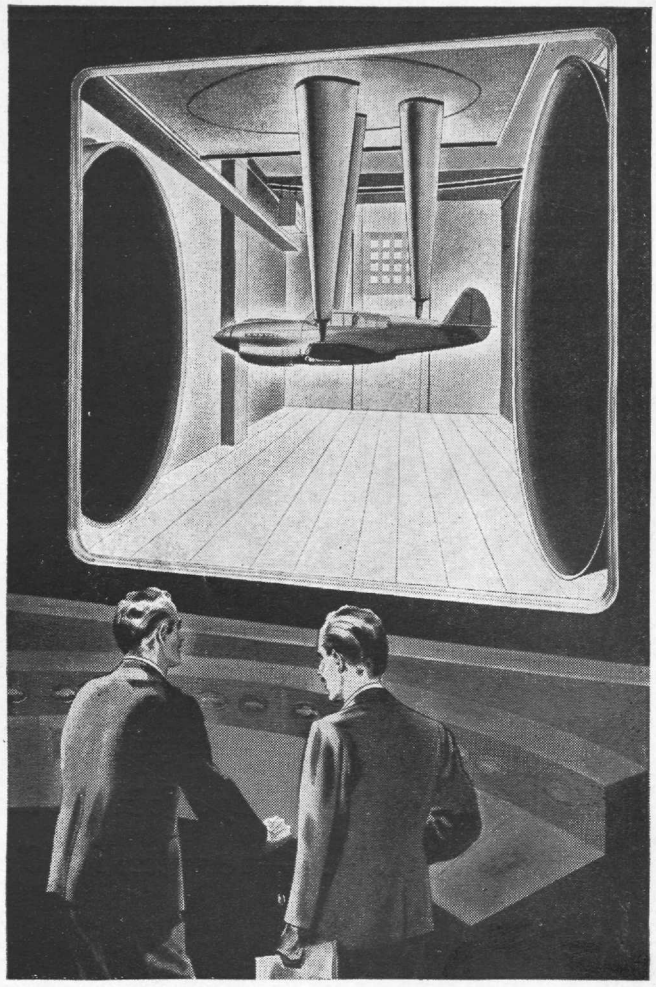
Army officials asked Westinghouse to take over the job of *building the electric motor* to drive the fans in this tunnel.

The two fans were to be truly colossal . . . 40 feet across, with a combined weight of nearly 150 tons. They were to be mounted on a 16-inch solid steel shaft, 120 feet long. Merely starting this great mass in motion, with minimum disturbance to the power system, was the toughest kind of engineering problem.

To complicate the problem further, a wide range of air speeds is required for wind-tunnel testing. And at each air speed the motor speed must be held constant, regardless of fluctuations in the electric power lines.

L. A. Kilgore . . . in collaboration with J. C. Fink . . . tackled the problem. In twelve months these Westinghouse engineers designed and supervised the construction and installation of a 40,000 hp wound-rotor induction motor . . . world's largest of its kind . . . an installation that met every Army requirement.

That 40,000 horse power motor . . . a direct result of Westinghouse "know how" . . . is now in service in the new $2,500,000 wind-tunnel at Wright Field. Large airplane models and actual-size motors, with whirling propellers, are tested and studied in its 400-mile-an-hour windstream.



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Kilgore and Fink have given vital aid to winning the war . . . for they have helped to make it possible for Army experts to learn many new facts about plane performance and plane design, facts of utmost importance in gaining and maintaining air supremacy over the Axis.

Today the need for engineers is very great. Of the 300 young engineering graduates who joined Westinghouse last spring, many are already showing great promise in engineering.

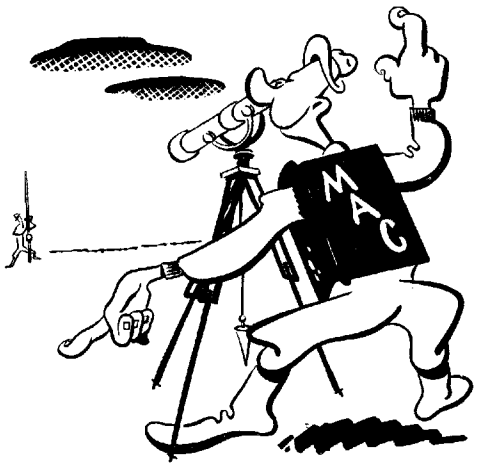
Westinghouse looks to the Class of '43 for its future scientists and engineers.

• • •

THE WESTINGHOUSE ENGINEER . . . a quarterly magazine brimful of interesting articles on electronic research and electrical engineering . . . keeps you posted on the latest scientific developments. Profusely illustrated. Subscription, only 50¢ a year. Address: Westinghouse Electric & Manufacturing Company, Department 6N-17, East Pittsburgh, Pennsylvania.

Westinghouse

. . . MAKING ELECTRICITY WORK FOR VICTORY



On the Level!

Your 1943 Makio is shaping up as the best yearbook in the country. Buy yours now for $3.50 and beat the rise in price.

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December first the price of the Makio will rise to $4.00. Don't delay! Buy yours today! Join the army of Makio subscribers now. 500 pages—6 pounds—between 3000 and 4000 pictures. What a book!

EVERYONE'S INVITED:

Every student at Ohio State is invited to have his picture in the 1943 Makio. Just make an appointment at the Makio office, Room 20, Ohio Union. The price is $1.00 to an underclassman and $2.00 to a Senior Makio subscriber. Your official Makio photographer is Morehouse-Martens.

Your 1943 Makio is on sale at Hennick's, Long's or Makio office in the Ohio Union. Solicitors cover the campus like sunshine.

YOUR 1943 makio

IF IT HAPPENS AT OHIO STATE, IT'S IN THE MAKIO!

The OHIO STATE ENGINEER

Vol. XXVI | November, 1942 | No. 1

OUR COVER

The inset photo shows a 100 ton water wheel generator being installed at Grand Coulee Dam, Washington. This generator has a capacity of 108,00 K.W..

Cut Courtesy of Westinghouse

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Published in the months of November, December, February, March, April, May and June by the students in the College of Engineering, The Ohio State University, Columbus, Ohio. Subscription price, 97 cents (tax 3 cents) per year for seven copies: Single copies, 15 cents each. Make checks and money orders payable to THE OHIO STATE ENGINEER.

Entered as second-class matter May 15, 1912, at the post office at Columbus, Ohio, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized December 8, 1922

To all engineers in the jungles of Brazil, Australia, Alaska, Canada, or "somewhere":

PHILOSOPHY CODE

O, I'm Mother Nature's Gypsy Child
And this twining river makes me wild,
There are no codes or robes for me . . .
But Sun and Wind and Rain and Sea,
To my castle of dreams they have fashioned a key
And mystic the spell they've woven for me
One turn to the right is my DESTINY
So take it my friend, and I'll follow thee.

Irene S. McKinley.

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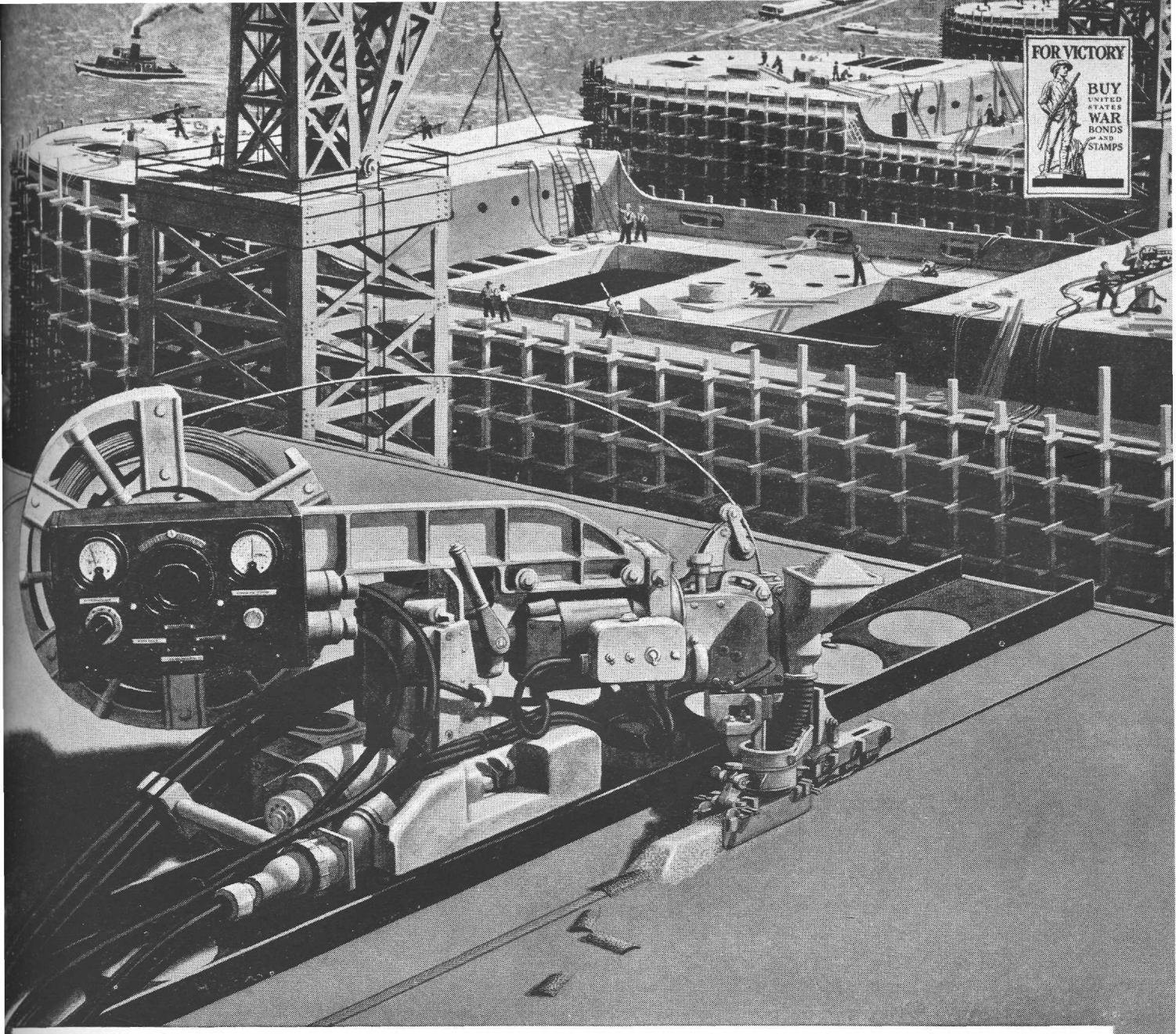

MAKING ONE-PIECE SUITS FOR *SHIPS!*

THERE'S NEWS on America's ship ways today . . . an amazing machine that unites steel plates without noise, fuss, sparks or visible arc! A process that is helping to construct those marvels of speed, strength, safety, and carrying capacity . . . "all-welded" ships!

This process . . . known as "Unionmelt" Welding . . . joins steel plates of any commercial thickness as much as 20 *times faster* than any other similarly applicable method! And it produces uniformly high-quality welds!

How does it work? A special welding composition . . . "Unionmelt" . . . flows from a hopper and blankets the edges to be joined. Within this granulated mixture, intense concentrated heat is generated by electric current. A bare metal electrode and the edges being welded are melted and fused. Some of the "Unionmelt" melts and remains as a temporary protective coating over the weld.

The process is completely automatic. Special apparatus feeds the "Unionmelt," the welding rod, and the electric current. Speed and current values are adjusted by an operator.

"Unionmelt" welding is also speeding up the construction of fighting tanks and chemical tanks . . . artillery mounts and aircraft parts . . . pressure vessels and locomotive boilers . . . pipe and pipe lines . . . and all kinds of heavy mechanical equipment.

Working with this unique process is an astoundingly fast Linde method of preparing steel plates for welding. White-hot oxy-acetylene flames . . . cutting simultaneously at different angles . . . bevel and square-up steel plates as fast as they are needed! Together, these two processes are speeding up the fabrication of key equipment at a remarkable rate.

Many years of research into welding, flame-cutting, flame-fabricating, and flame-conditioning of metals have given Linde engineers a vast store of useful knowledge about these methods. Have you a war production problem which might be solved by this "know how"?

The important advances in the cutting, conditioning and fabrication of metals made by The Linde Air Products Company have been facilitated by collaboration with Union Carbide and Carbon Research Laboratories, Inc., and by the metallurgical experience of Electro Metallurgical Company—which companies also are Units of Union Carbide and Carbon Corporation.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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Engineers At War